

Atty. Dkt. No.: 60,680-536  
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**CLAIMS**

We claim:

1. A steer-axle assembly, comprising:
  - an axle segment having an end;
  - a steering knuckle assembly rotably mounted to the end of the axle segment, the steering knuckle assembly having at least one receiving portion;
  - a kingpin having a body segment and an interface segment, the body segment fixedly coupled to the axle segment and each interface segment extending through a corresponding receiving portion of the steering knuckle assembly; and
  - at least one sealant compressible shim adjacent the interface segment, filling a gap between the axle segment and steering knuckle assembly around the kingpin, the sealant compressible shim having:
    - a first substantially rigid shim layer disposed about the kingpin body segment in contact with the steering knuckle assembly;
    - a second substantially rigid shim layer disposed about the kingpin body segment in contact with the axle segment; and
    - at least one compressible shim layer between the first and second substantially rigid shim layers.
2. The steer-axle assembly of claim 1 wherein each receiving portion of the steering knuckle assembly includes a bore having a bushing mounted therein and the kingpin interface segment is received within the bushing.
3. The steer-axle assembly of claim 1 wherein the system further includes an end seal between the kingpin interface segment and the corresponding receiving portion in the steering knuckle assembly.
4. The steer-axle assembly of claim 2 further comprising at least one inner seal between the kingpin interface segment and the bushing.

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5. The steer-axle assembly of claim 4 wherein the system further includes an end seal between the kingpin interface segment and the corresponding receiving portion of the steering knuckle assembly.

6. The steer-axle assembly of claim 1 wherein the first and the second substantially rigid shim layers are formed from a metal material.

7. The steer-axle assembly of claim 6 wherein the metal shim material is selected from the group consisting of: steel, plain carbon steel, hard temper SAE grade steel 1008, and hard temper SAE grade steel 1010.

8. The steer-axle assembly of claim 1 wherein the compressible shim layer is formed of a compressible elastomeric material.

9. The steer-axle assembly of claim 8 wherein the compressible elastomeric material is a material selected from the group consisting of: sponge rubber, neoprene, neoprene blend, neoprene sponge ASTM D-1056-85 grade 2C1, nitrile rubber, nitrile BUNA N.

10. The steer-axle assembly of claim 1, further comprising: a mounting means for rotatably mounting the steering knuckle assembly relative to the axle segment.

11. The steer-axle assembly of claim 10 wherein the mounting means includes at least one bearing surrounding the kingpin between the axle segment and the at least one steering knuckle assembly, the bearing having a first portion fixedly coupled to the axle segment,

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and a second portion fixedly coupled to the at least one steering knuckle assembly.

12. A steer-axle assembly for sealing a gap between an axle segment and a steering knuckle assembly, comprising:

an axle segment having an outer end;

a steering knuckle assembly rotably coupled to the outer end and having an upper receiving portion and a lower receiving portion;

a kingpin having a central body segment fixedly coupled to the axle segment, and an upper interface segment received within the upper receiving portion and a lower interface segment received within the lower receiving portion of the steering knuckle assembly; and

a sealant compressible shim adjacent the upper interface segment of the kingpin, filling a gap between the axle segment and steering knuckle assembly around the kingpin, the sealant compressible shim having:

a first substantially rigid shim layer disposed about the kingpin body segment in contact with the steering knuckle assembly;

a second substantially rigid shim layer disposed about the kingpin body segment in contact with the axle segment; and

at least one compressible shim layer between the first and second substantially rigid shim layers.

13. The steer-axle assembly of claim 12 further comprising:

a mounting means for rotatably mounting the steering knuckle assembly relative to the axle segment.

14. The steer-axle assembly of claim 13 wherein the mounting means includes a bearing adjacent the lower interface segment, the bearing surrounding the kingpin between the axle segment and the steering knuckle assembly, the bearing having a first portion

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fixedly coupled to the axle segment, and a second portion fixedly coupled to the steering knuckle assembly.

15. A sealant compressible shim for filling a gap between a steering knuckle assembly and an axle segment, comprising:

a first substantially rigid shim layer;  
a second substantially rigid shim layer; and  
at least one compressible shim layer between the first and second substantially rigid shim layers; and  
wherein the first substantially rigid shim layer, second substantially rigid shim layer, and the at least one compressible shim layer are adapted to be mounted about a kingpin body segment and together fill a gap between a steering knuckle assembly and axle segment.

16. The sealant compressible shim of claim 15 wherein the first and the second substantially rigid shim layers are formed from a metal material.

17. The sealant compressible shim of claim 16 wherein the metal material is selected from the group consisting of: steel, plain carbon steel, hard temper SAE grade steel 1008, and hard temper SAE grade steel 1010.

18. The sealant compressible shim of claim 15 wherein the compressible shim layer is formed of a compressible elastomeric material.

19. The sealant compressible shim of claim 18 wherein the compressible elastomeric material is a material selected from the group consisting of: sponge rubber, neoprene, neoprene blend, neoprene sponge ASTM D-1056-85 grade 2C1, nitrile rubber, nitrile BUNA N.